

**VEHICLE THEFT DETERRENT SYSTEM**

**CROSS REFERENCE TO RELATED APPLICATIONS**

This application claims priority to co-pending United States Provisional Patent Application  
5 having Serial No. 60/456,274 filed 03/20/2003 entitled "Auto Anti Theft Unit", having a common  
applicant herewith.

**FIELD OF THE DISCLOSURE**

The disclosures made herein relate generally to vehicle theft deterrent systems and, more  
particularly, to vehicle theft deterrent systems configured for selectively disabling a vehicle starting  
10 system.

**BACKGROUND**

Conventional vehicle theft deterrent systems are often configured for selectively disabling a  
vehicle starting system by selectively breaking continuity in one or more appropriate starter switch  
wires/cables. Such conventional theft deterrent systems exhibit one or more shortcomings that limit  
15 their effectiveness. For example, one limitation is that such conventional theft deterrent systems are  
typically spliced into the starter switch wires under the dashboard, making access to such starter  
switch wires convenient for installation purposes. However, the under-dash location of such starter  
switch wires also makes such splices convenient to access by car thieves without drawing  
undesirable attention to themselves. Another limitation associated with such conventional systems is  
20 that they do not selectively break the continuity of the starting system power supply circuit (e.g., a  
cable) that is typically connected directly between the battery and the starter.

**PATENT APPLICATION**

Therefore, a vehicle theft deterrent system that disables a vehicle starting system and that overcomes limitations associated with such conventional vehicle theft deterrent systems would be useful and novel.

SUMMARY OF THE DISCLOSURE

Embodiments of the inventive disclosures made herein are comprised by vehicle theft deterrent systems that selectively disabling power supply to a starter of a vehicle starting system.

5        In one embodiment, a vehicle theft deterrent system comprises continuity circuitry and control circuitry. The continuity circuitry is configured for enabling electrical continuity between a battery and a starter of a vehicle starting system to be selectively broken and made. The control circuitry is connected to the continuity circuitry and is configured for enabling the continuity circuit to be selectively set to the starting system disabled mode and the starting system enabled mode. The  
10      continuity circuitry is in a starting system disabled mode when the electrical continuity is broken and in a starting system enabled mode when the electrical continuity is made.

In another embodiment, a vehicle theft deterrent system comprises a battery switch, an actuation device and a signal receiver. The battery switch is configured for enabling electrical continuity of a power cable connected between a battery and a starter of a vehicle starting system to  
15      be selectively broken and made. The battery switch is in a starting system disabled mode when the electrical continuity is broken and in a starting system enabled mode when the electrical continuity is made. The actuation device is connected to the battery switch and is configured for selectively switching the battery switch between the starting system disabled mode and the starting system enabled mode. The battery switch is configured for being spliced into the power cable in an in-line  
20      fashion. The actuation device is connected to a switching mechanism of the battery switch and is configured for moving the switching mechanism between a first position and a second position. The first position corresponds to the starting system disabled mode and the second position corresponds to the starting system enabled mode. The signal receiver is coupled to the actuation device. The signal receiver facilitates setting the actuation device to the first position in response to receiving a  
25      first control signal and setting the actuation device to the second position in response to receiving a second control signal.

Accordingly, it is a principal object of the inventive disclosures made herein to provide methods and equipment that significantly increase the effort to accomplish unauthorized starting of a vehicle.

5 It is another object of the inventive disclosures made herein to provide a vehicle theft deterrent system that is connected between the starter and the battery of a vehicle starting system.

It is another object of the inventive disclosures made herein to provide a vehicle theft deterrent system that selectively breaks continuity in a starting system power supply circuit.

10 It is another object of the inventive disclosures made herein is to provide a vehicle theft deterrent system that utilizes an electromagnetic switch or servo for selectively breaking continuity in a starting system power supply circuit.

It is another object of the inventive disclosures made herein to provide a vehicle theft deterrent system having components within a tamper-resistant enclosure.

15 It is another object of the inventive disclosures made herein to provide a vehicle theft deterrent system is activated and deactivated using a wireless control apparatus.

These and other objects of the inventive disclosures made herein will become readily apparent upon further review of the following specification and associated drawings.

**BRIEF DESCRIPTION OF THE DRAWINGS**

FIG. 1 depicts a vehicle starting system in accordance with an embodiment of the inventive disclosures made herein.

FIG. 2 depicts a theft deterrent system in accordance with an embodiment of the inventive  
5 disclosures made herein

**DETAILED DESCRIPTION OF THE DRAWINGS**

FIG. 1 depicts a vehicle starting system 10 in accordance with an embodiment of the inventive disclosures made herein. The vehicle starting system 10 includes a battery 12, a starter, 14 a power cable 15, a ground cable 16, a theft deterrent system 18 and an accessory item power cable 5 20. The theft deterrent system 18 includes a theft deterrent unit 21 and a signal transmitter 22. The theft deterrent unit 21 is spliced into the power cable 15 in an in-line fashion and is configured for enabling electrical continuity between the battery 12 and the starter 14 to be selectively broken and made.

Referring now to FIGS. 1 and 2, the theft deterrent unit 21 includes a battery switch 23, an 10 actuation device 24, a signal receiver 26, a relay switch 28, an enclosure base 30 and an enclosure cover 32. The battery switch 23 is electrically coupled between the battery 12 and the starter 14. The battery switch 23 is configured for selectively breaking and making electrical continuity of the power cable 15 between the battery 12 and the starter 14. The battery switch and, thus, the theft 15 deterrent unit 10 are in a starting system disabled mode when the electrical continuity is broken and in a starting system enabled mode when the electrical continuity is made. In one embodiment, the tamper-resistant enclosure (e.g., made of steel) comprises the enclosure base 30 and the enclosure cover 32 and has access portals extending therethrough.

The actuation device 24 (e.g., an electromagnetic solenoid, an electromechanical servo, etc) is connected to the battery switch 23 and is configured for selectively switching the battery switch 20 between the starting system disabled mode and the starting system enabled mode. In one embodiment, the actuation device 24 is connected to a switching mechanism (not specifically shown) of the battery switch 23 and is configured for moving the switching mechanism between a first position and a second position (e.g., physical positions, logical positions, etc). The first position of the switching mechanism corresponds to the starting system disabled mode and the second position 25 of the switching mechanism corresponds to the starting system enabled mode.

The signal receiver 26 is coupled to the actuation device 24 through the relay switch 28 (e.g., a power relay). The signal receiver 26 facilitates setting the actuation device 24 to a first position corresponding to the starting system disabled mode in response to receiving a first control signal and setting the actuation device to a second position corresponding to the starting system enabled mode  
5 in response to receiving a second control signal. The signal transmitter 34 is configured for transmitting the first control signal and the second control signal for reception by the signal receiver 26. In one embodiment, such as depicted in FIGS. 1 and 2, the signal transmitter 34 is a wireless signal transmitter and the signal receiver 26 is correspondingly a wireless signal receiver, which are jointly configured for sending and receiving wireless signals (e.g., radio frequency signals). In  
10 another embodiment, not specifically shown, the signal receiver 26 and the signal transmitter 34 are replaced by a control switch that is electrically coupled (e.g., via one or more wires) to the relay switch 28.

In one embodiment, the battery switch 23 includes a plurality of electrical terminations. Cables ends, screw-down terminal, junction block contacts, electrical connector contacts and the like  
15 are examples of such electrical terminations. A first one of such electrical terminations is configured for being connected to a first connection point of the power cable 15. A second one of such electrical terminations is configured for being connected to at least one of a second connection point of the power cable 15, an electrical terminal of the battery 12 and an electrical terminal of the starter  
14. A third one of such electrical terminations is coupled to either the first one of such electrical  
20 terminations or the second one of such electrical terminations for the purpose of having a power lead of a vehicle accessory item connected thereto for enabling electrical power to be provided to the accessory item while the battery switch 23 is in the starting system disabled mode.

Turning more to a brief discussion of circuitry in accordance with embodiments of the inventive disclosures made herein, continuity circuitry is configured for enabling electrical continuity  
25 between a battery and a starter of a vehicle starting system to be selectively broken and made. Such continuity circuitry is in a starting system disabled mode when the electrical continuity is broken and in a starting system enabled mode when the electrical continuity is made. Control circuitry is connected to the continuity circuitry and is configured for enabling the continuity circuit to be

selectively set to the starting system disabled mode and the starting system enabled mode. In one embodiment, the continuity circuitry includes a battery switch and the control circuitry includes an actuation device, a signal receiver and a relay switch. The battery switch is electrically coupled to the actuation device, the signal receiver and the relay switch, thus coupling the continuity circuitry to the control circuitry.

In summary, embodiments of vehicle theft deterrent systems in accordance with the inventive disclosures made herein are designed to provide a high level of security against theft for owners of vehicles (e.g., cars, trucks SUV's, etc). Such theft deterrent systems operate in a manner unique from other anti-theft products. With such a theft deterrent system attached to a vehicle and in the active mode, a thief will not be able to crank the vehicle's engine, thus making it difficult to steal the vehicle.

Such theft deterrent systems comprise known and/or commercially available components (e.g., electronic components, electrical components, and hardware components, etc) that are interconnected to provide an easily installed and relatively simple operate theft deterrent system. The components of such theft deterrent systems include a remote transmitter unit, receiver unit, relay switch, solenoid, battery switch, and tamper-resistant enclosure. The receiver unit, relay switch, solenoid, battery switch, and enclosure are comprised by a control unit, which is typically mounted in the engine compartment of the vehicle, under the vehicle or in the truck area of the vehicle. In one embodiment, the tamper resistant enclosure includes a base and cover made from steel with wire/termination portals, thereby providing protection to the components of the theft deterrent system from incidental damage and the effects of natural/environmental conditions.

Theft deterrent systems in accordance with embodiments of the disclosures made herein are connected between the battery and the starter of the vehicle. In one embodiment, a power supply cable connected between the battery and the starter is severed. Then, a first severed end of the power supply cable is connected to a first batter switch termination of the theft deterrent system and a second severed end of the power supply cable is connected to a second battery switch termination of

the theft deterrent system. In this manner, the theft deterrent system is configured for selectively disabling the vehicle's starter.

The theft deterrent system comprises actuation circuitry configured for selectively breaking and making continuity in the power supply cable connected between the starter and the battery of the vehicle. The actuation circuitry including an electronic signal receiver unit, solenoid, relay switch, battery switch and suitable terminations for making connections to the battery switch. In one embodiment, the battery switch is an electromagnetic switch or serve that enables continuity to be selectively made and broken.

In one embodiment, a remote control transmitter unit (e.g., small enough to carry on a key chain) is provided for activating and deactivating the theft deterrent system. The transmitter includes an electronic components configured for sending signals capability and interpretable by the receiver unit. Activation of the transmitter unit sends a signal to the receiver unit. This activates the solenoid through the relay switch that turns the battery switch. At this point, the starter will be disconnected from the battery, making it virtually impossible to start the vehicle.

In the preceding detailed description, reference has been made to the accompanying drawings that form a part hereof, and in which are shown by way of illustration specific embodiments in which the invention may be practiced. These embodiments, and certain variants thereof, have been described in sufficient detail to enable those skilled in the art to practice the invention. It is to be understood that other suitable embodiments may be utilized and that logical, mechanical, chemical and electrical changes may be made without departing from the spirit or scope of the invention. For example, functional blocks shown in the figures could be further combined or divided in any manner without departing from the spirit or scope of the invention. To avoid unnecessary detail, the description omits certain information known to those skilled in the art. The preceding detailed description is, therefore, not intended to be limited to the specific forms set forth herein, but on the contrary, it is intended to cover such alternatives, modifications, and equivalents, as can be reasonably included within the spirit and scope of the appended claims.